

What is claimed is:

1. A coreless motor comprising:

a ring-shaped coil yoke fitted to the interior of a casing, which has a conductive-use coil connected to a ring-shaped magnet, whose external circumference face stands opposed to the internal circumference face of the coil yoke, and the coil designed to revolve jointly with the rotating axis following power input to the said coil;

wherein the said coil confronts the upper and lower faces of the magnet and consists of a flat portion whose plane part takes an arc form and of a curved-and-folded portion composed of a winding unit confronting the external circumference side face of the magnet, while the section from one end of the lead wire composing these winding units to its other end constitutes a continuous hollow unit;

wherein a thin-sheet-shaped flange is installed on the lower part of the coil holder fixed to the periphery of the said rotating axis, while multiple coils are attached so as to be arranged in line with the circumference direction of the magnet by fixing the flat portion on the lower side of each coil to the flange; and

wherein thin/round annulus-shaped upper-side reinforcing plates are attached to the flat portion on the upper side of each coil.

2. The coreless motor stated in claim 1, which is constituted by attaching a thin/annulus ring-shaped lower-side reinforcing plate to the further below part of the flat portion of the coil, which is fixed to the lower face of the said coil holder flange.

3. The coreless motor stated in claim 2, whose lower-side reinforcing plate mentioned above is installed in a space up to the coil holder flange so as to be in parallel with the flange through the mediation of a spacer, whose length is almost equal to the thickness of the lower-side flat portion of the coil, while the flat lower-side portion of the coil is put into, and fixed to, the gap formed by the spacer between the flange and the lower-side reinforcing plate.

4. The coreless motor stated in claim 1, whose upper-side reinforcing plate mentioned above consists of conductive materials, with one end of each coil linked to this upper-side reinforcing plate, and the other end of the coil connected to the commutators installed around the rotating axis in the lower portion of the coil holder.

5. A coreless motor comprising;

a ring-shaped coil yoke fitted to the interior of a casing, which has a conductive-use coil connected to a ring-shaped magnet, whose external circumference face stands opposed to the internal circumference face of the coil yoke, and the coil designed to revolve jointly with the rotating axis following power input to the said coil;

wherein the said coil confronts the upper and lower faces of the magnet and consists of a flat portion whose plane part takes an arc form and of a curved-and-folded portion composed of a winding unit confronting the external circumference side face of the magnet, while

the section from one end of the lead wire composing these winding units to its other end constitutes a continuous hollow unit;

wherein the said magnet is 4-polar-magnetization arranged in the radius direction, and as for the coils mentioned above, 3 are installed around the rotating axis; and

wherein for commutators fixed around the rotating axis, 6-segment ones are used, with 2 brushes set in positions each forming an angle of  $90^\circ$  in relation to the commutator.

6. A coreless motor comprising;

a ring-shaped coil yoke fitted to the interior of a casing, which has a conductive-use coil connected to a ring-shaped magnet, whose external circumference face stands opposed to the internal circumference face of the coil yoke, and the coil designed to revolve jointly with the rotating axis following power input to the said coil;

wherein the said coil confronts the upper and lower faces of the magnet and consists of a flat portion whose plane part takes an arc form and of a curved-and-folded portion composed of a winding unit confronting the external circumference side face of the magnet, while the section from one end of the lead wire composing these winding units to its other end constitutes a continuous hollow unit;

wherein the said magnet is 2-polar-magnetization arranged in the diameter direction, and as for the coils mentioned above, 3 are installed around the rotating axis; and

wherein for commutators fixed around the rotating axis, 3-

segment ones are used, with 2 brushes set in positions parallel with each other in relation to the commutator.

7. A coreless motor stated in claim 1, 5 or 6, wherein the aforementioned magnet is fixed to the external circumference of the ring-shaped magnet holder, which is equipped with a cylinder unit, designed to hold a bearing, in its upper part, with this cylinder unit engaged with, and fitted to, a boss formed in the center of the top panel of the casing, while the said rotating axis is held, in a revolution possible way, by a bearing installed within the said cylinder unit.

8. The coreless motor stated in claim 7, whose magnet holder mentioned above has a dented portion on its lower side, with the upper portion of the coil holder composed so as to touch this dented portion of the magnet holder.

9. The coreless motor stated in claim 1, 5 or 6, wherein the internal surface of the coil yoke is shaped in line with the external circumference side face and upper/lower faces of the said coil, and the coil yoke is formed by bonding together the upper half portion of the coil yoke that contains the upper half of the coil and its lower half portion that contains the lower half of the coil.

10. The coreless motor stated in claim 1, 5 or 6, wherein the said

magnet is composed by arranging 4 arc-shaped magnets, individually magnetized in the radius direction, in a ring form.